

PROCEEDINGS
OF THE
American Forestry Association

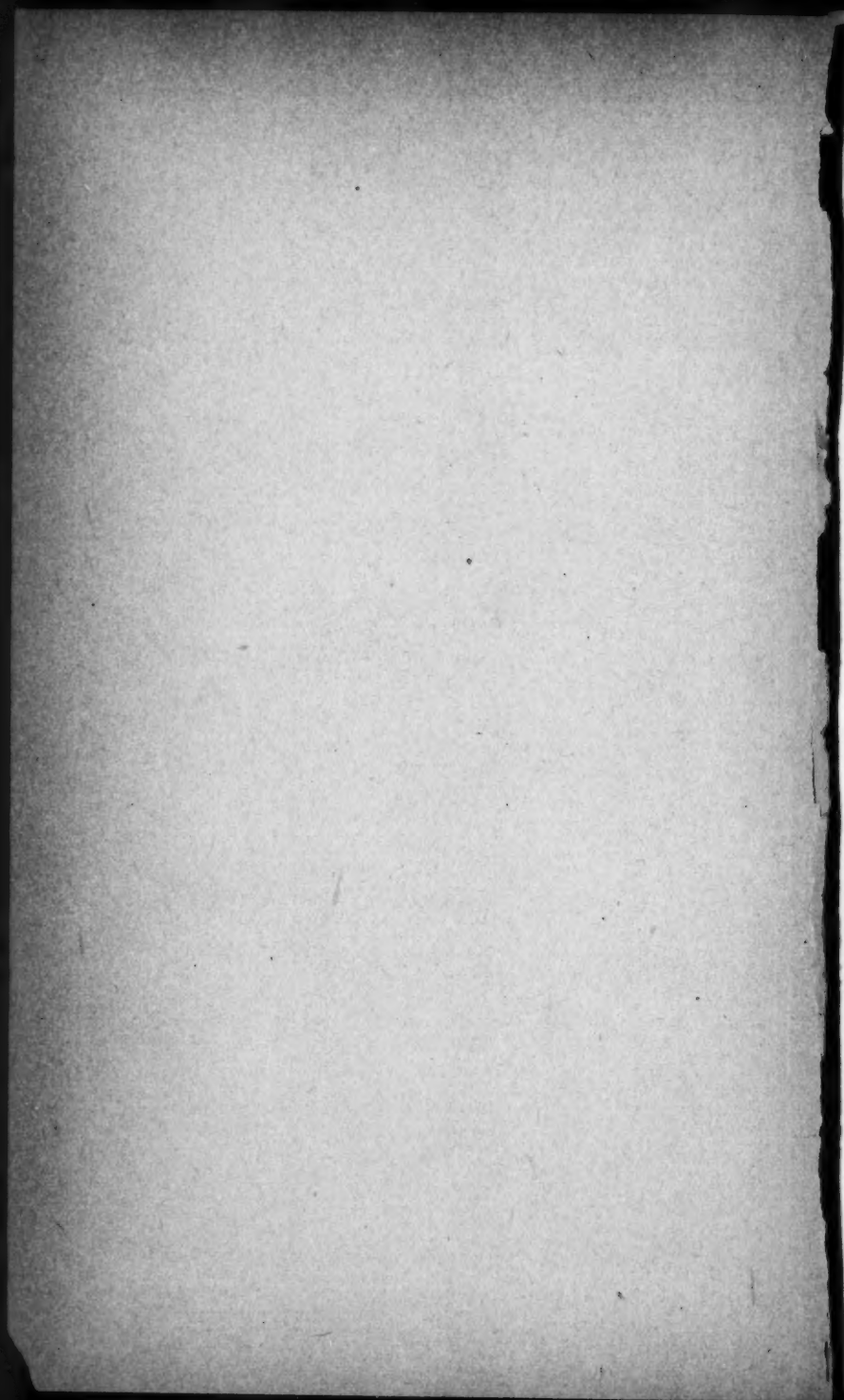


AT THE
Tenth, Eleventh, and Twelfth Annual Meetings,
Washington, December, 1891, 1892, and 1893,
AND AT THE
World's Fair Congress, Chicago, October 18 and 19, 1893.

VOLUME X.

Pages 1 to 44

WASHINGTON, D. C.:
1894.



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NOTICE.

The Proceedings of the American Forestry Association have hitherto been published irregularly, the volumes not being numbered. With the improved financial condition of the association, and its greatly increased membership, a regular issue of the annual proceedings in future appears warranted, and it seems desirable to designate, by numbers, not only the coming volumes but also those previously issued. The present volume is, therefore, numbered X. The series of previous volumes includes the following publications:

- Vol. I.—Proceedings of the special meeting at Montreal, August, 1882. Papers read before the meeting printed separately by the Canadian Government in the Ontario Fruit Growers' Report. (The proceedings of the first annual meeting, that held at Cincinnati, April 25-29, 1882, were not published in pamphlet form.)
- Vol. II.—Proceedings of the second annual meeting, at St. Paul, August, 1883. Also, Forestry Bulletins No. 1 (May, 1884); No. 2 (September, 1884); No. 3 (January, 1885).
- Vol. III.—Proceedings of the special meeting at Washington, D. C., May, 1884, and third annual meeting, at Saratoga, New York, September, 1884.
- Vol. IV.—Proceedings of the fourth annual meeting, held at Boston, September, 1885.
- Vol. V.—Proceedings of the fifth annual meeting, held at Denver, Colorado, September, 1886. (Newspaper report.)
- Vol. VI.—Proceedings of the sixth annual meeting, held in Springfield, Illinois, September, 1887.
- Vol. VII.—Proceedings of the seventh annual meeting, held at Atlanta, Ga., December, 1888, and of the eighth annual meeting, held at Philadelphia, Pa., October, 1889.
- Vol. VIII.—Proceedings of the summer meeting, held in Quebec, September, 1890, and of the ninth annual meeting, held in Washington, D. C., December, 1890.
- Vol. IX.—Papers read at joint session of the American Economic Association and the American Forestry Association, held at Washington, D. C., December, 1890.

The present volume, X, will contain the proceedings at the tenth, eleventh, and twelfth annual meetings, held in 1891, 1892, and 1893, and those of the special meeting at the World's Fair Congress in Chicago in 1893. In order to expedite the long-delayed issue of this publication, it will be printed in separate parts or brochures, with continuous paging, so that the parts can finally be bound into one volume. Copies of former volumes, as far as on hand, can be had at current prices by application to the Secretary. Members receive, besides the publications of the association, the bi-monthly periodical known as "Forest Leaves."

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- Allan, Hon. G. W., Toronto, Ontario.
 Boyd, M. M., Bobcageon, Ontario.
 Campbell, Archibald, Quebec.
 Craig, John, Dominion Experiment Farm, Ottawa, Ontario.
 Crown Lands Department, Quebec.
 Crown Lands Department, Treasury Department, Toronto, Ontario.
 *Denton, Jno. M., London, Ontario.
 *Drummond, A. T., Montreal.
 *Joly, Hon. H. G., Le Clercville, Quebec.
 Little, Wm., Montreal.
 Perley, George H., Ottawa, Ontario.
 Price, Herbert N., Quebec.
 Robitaille, Hon. L. A., Box 542, Quebec.
 Ross, Hon. David A., Quebec.
 *Russell, A. J., Ottawa.
 Saunders, Wm., Central Experimental Farm, Ottawa.
 *Shanley, Walter, Montreal.
 Turner, Richard, Quebec.

CONSTITUTION
OF THE
AMERICAN FORESTRY ASSOCIATION.

ARTICLE 1. This association shall be known as the American Forestry Association.

ARTICLE 2. The objects of this association shall be the discussion of subjects relating to tree-planting, the conservation, management, and renewal of forests, and the climatic and other influences that affect their welfare; the collection of forest statistics; and the advancement of educational, legislative, or other measures tending to the promotion of these objects. It shall especially endeavor to centralize the work done, and diffuse the knowledge gained.

ARTICLE 3. Any person may become a member of this association, subject to approval by the executive committee, by the payment of the annual dues. The annual dues shall be two dollars. Any member may become, by the payment of fifty dollars at one time, a life member, and shall not be liable thereafter to annual dues. Any person contributing one hundred dollars to the permanent fund of the association shall be a Patron.

ARTICLE 4. The officers of this association, to be elected at the annual meeting, shall be a president, one vice-president for each state, territory, and province represented in the association, a treasurer, a recording secretary, a corresponding secretary, and six other persons to serve on the executive committee. The executive committee shall consist of the president, the vice-president for the District of Columbia, the treasurer, the two secretaries together with the six persons above designated. Three of this committee shall constitute a quorum. This committee shall choose its own chairman.

ARTICLE 5. The president shall preside at all meetings of the association in general session, and in his absence a vice-president shall preside.

ARTICLE 6. The recording secretary shall keep a record of the proceedings of the association, and shall be custodian of all documents, books, and collections ordered to be preserved.

ARTICLE 7. The corresponding secretary shall conduct the correspondence of the association.

ARTICLE 8. The treasurer shall have charge of all funds, and pay out the same on the direction of the executive committee.

ARTICLE 9. The association at any regular meeting, or its executive committee in the intervals between its meetings, may appoint such local or special committees as may be deemed proper, and shall define their duties.

ARTICLE 10. The annual meeting of the association shall be in the months of August, September, or October, or at such times and places as shall be determined by a vote in general session or by the executive committee. Special meetings may be called by the executive committee.

ARTICLE 11. At each annual meeting there shall be an election of officers for the ensuing year, and they shall remain in office until others are chosen. In cases of vacancies occurring in the intervals between the annual meetings, they may be filled by the executive committee until others are selected. In case of absence of an officer at a regular meeting his place may be deemed vacant.

ARTICLE 12. The officers of states, territories, provinces, or local forestry associations, or their delegates, or the delegates of any Government, may participate in the proceedings of the association as honorary members.

ARTICLE 13. This constitution may be amended by a two-thirds vote of the members present at any annual meeting.

BY-LAWS.

1. Papers or abstracts of papers to be read must be sent two weeks before any meeting, for classification, to the corresponding secretary.

2. The following classification of subjects is adopted for the reading of papers:

Section A. Forest planting, forest management, forestry proper, preservation of forests.

Section B. Forest economy, technology and statistics.

Section C. Applied science and climatology, general topics.

3. Contributors who are present shall have the preference in reading their papers.

4. Any member shall be entitled to the privilege of using any books or documents, not of record, at the discretion of the recording secretary.

Tenth Annual Meeting.

1891.

The tenth annual meeting of the association was held at Washington, D. C., December 29, 1891. In the absence of President Alvord, Hon. Edwin Willits, Assistant Secretary of Agriculture and one of the vice-presidents, took the chair as presiding officer and called the association to order.

After the reading of the minutes of the last meeting by the recording secretary, the corresponding secretary read his report. From this it appeared that three members of the association had died during the last year and that 43 new members had been added to the roll of membership. The report also announced a very marked and encouraging degree of interest in forestry in several of the Western States.

The report of the treasurer showed the receipt of \$589.53 during the year, applicable to current expenses, and a payment of \$409.69, leaving a balance in the treasury of \$179.84 for current expenses. The permanent fund was also increased by \$250, making the fund now \$812.87.

The report of the committee on Arbor Day showed evidence of a growing interest in the observance of this day all over the country. It is established now in distant Oregon and North Dakota. In New York, which has been tardy in establishing Arbor Day, it has been adopted with great enthusiasm, and important results are already manifest in connection with the public schools. It has become an important co-efficient in village improvement. The observance of the day has become a patriotic feature, especially in those Southern States which have fixed its date on Washington's birthday. The custom of planting memorial trees in honor of Washington, Lincoln, Grant, and other patriots has become general.

The results of Arbor-Day tree-planting in an economic point of view are even marvellous. In the twenty years since the origin of the day in Nebraska it is reported on good authority that more than 35,000,000,000 trees have been planted in that State.

The executive committee reported that its attention had been principally directed during the year to securing a liberal applica-

tion of the law of March 3, 1891, which, in section 24, authorizes the President of the United States to reserve woodlands, and also makes other provisions of the highest importance to the future of the public timber lands.

The law provides that the President may, by proclamation, from time to time, set aside any portions of the public woodlands as public reservations. At the same time, cutting off timber on the public timber lands is permitted in several of the States and Territories, if for use within the same by residents thereof, the regulation of such cutting being under the direction of the Secretary of the Interior; but the pleading that the cutting of the timber had been for domestic, mining, or manufacturing purposes shall be a defence in cases of trespass. The natural effect of this permission will be to stimulate the cutting of timber on the public lands thus thrown open to every one, with the probability that roving and irresponsible lumbermen will cut the best and deprive the permanent and law-abiding citizens of their just share in the forest resources.

Nothing can prevent this result but a wise and just system of management of the public lands, scrupulously protecting the rights of all and rigorously and impartially enforced. The proclamation of reserves by the President will be of little public benefit without such a system of management accompanying it. The Secretary of the Interior, with gratifying forethought, has endeavored to place an administrative check upon the wrongful appropriation of the public timber, by requiring a permit for cutting to be obtained from the General Land Office at Washington; but it is to be feared that this will be inadequate to prevent the evil results anticipated, especially as no local supervision can be provided for under existing appropriations.

Your committee, then, wishes to express emphatically its position regarding the proposed reservations and their management.

(1) Reservations in detached localities, while perhaps preferable to none, will not satisfy the needs of forest protection unless their number is sufficiently large to embrace practically all remaining public woodlands.

(2) The all-important problem is that of the management of these reservations made, or to be made. This should be solved at once and simultaneously with the making of the reservation.

(3) The principles upon which such management must proceed are laid down in a draft of suggestions for a bill, submitted here-

with by the committee, in which safeguards are provided to protect prior rights; the return of agricultural lands to entry; licenses to prospect for minerals, to camp, hunt, fish, and otherwise use the reservations legitimately; licenses to cut timber under regulations adapted to the necessities of the locality; protection against fire and theft, and such organization as will secure, with the co-operation of State authorities, the objects of the reservations, and at the same time offer as little friction as possible to existing conditions.

Interesting reports were then made by members and delegates in regard to the forest interests in their respective States, and the usual committees were appointed.

The afternoon session was devoted to the discussion of the subject presented by the report of the executive committee, and the consideration of the draft of a public bill designed to carry out the suggestions of the committee.

The Hon. J. W. Noble, Secretary of the Interior, addressed the association at length, expressing hearty sympathy with its aims, his readiness to receive suggestions in regard to the management of the timber lands, and his willingness to do all in his power to aid the association in its work.

The thanks of the association were given to Secretary Noble for his encouraging words.

The address of Secretary Noble was followed by a paper prepared by the Hon. Thos. H. Carter, Commissioner of the General Land Office. The object of the paper was to set forth the present attitude of the Government towards the objects of the association.

The association was next addressed by the Hon. Senator H. L. Dawes, who spoke at considerable length and in hearty commendation of the objects and work of the association. He spoke of the difficulties attendant upon the enforcement of law as being not less than those to be met in securing its enactment, and said that the ingenuity of the law-maker had never yet been equal to the ingenuity of the spoliator. He spoke of the power of public sentiment, and said: "You must get behind Congress and make Congressmen feel that behind them is a public sentiment that will demand that the spoliators shall not only take their hands off, but that the Government shall, so far as it is in its power, restore what has been lost."

The remainder of the session was occupied with the discussion of a series of questions, prepared by the executive committee, in regard to the establishment and management of the proposed

reservations. The first questions presented were, "What should be the extent or number of reservations, and what their character?" "What methods should be adopted for the purpose of avoiding interference with other interests and opposition to the establishment of the reservations?" "Shall the reserved lands be ceded as such to the individual States or remain, at least for the present, in possession of the General Government?"

In regard to these questions the views of the executive committee were given briefly, concluding with the statement that the wisest and most desirable result would be to have all the remaining public timber lands reserved. In the discussion that followed there was a general agreement of opinion that it would not be wise to cede the timber lands to the States, but that they should remain under the management of the General Government.

The next question presented for discussion was, "Shall the management of the public timber lands be carried on as a part of the business of the General Land Office, by a separate bureau of the Department of the Interior, by a bureau of the Department of Agriculture, or by an independent bureau?" The conclusion of the executive committee was stated to be, after much study of the subject, that the best course would be to place the management of the reservations under the control of a new division of the Department of the Interior. The association seemed to acquiesce in this opinion, and passed on to consider the question, "What regulations are necessary and desirable, *first*, to prevent fire; *second*, to regulate occupancy; *third*, to regulate the cutting of timber, and, *fourth*, for general administration?" The entire afternoon having been spent in this discussion, other questions, as to the qualification of officers for the administration of the reserves, and the methods to be adopted for securing State co-operation, were left without consideration, and the association adjourned to Wednesday, at the office of the Experiment Stations, Department of Agriculture.

WEDNESDAY, DECEMBER 30, 1891.

The association met at 10 o'clock, vice-president Northrop in the chair.

The committee on nominations and resolutions reported. They nominated for election the officers of last year, with a few exceptions only, viz: Mr. J. O. Barrett, of Minneapolis, as vice-president for Minnesota; Hon. Warren Higley, for New York; Hon. Albert

Roberts, of Nashville, for Tennessee, and Hon. George F. Edmunds, of Burlington, for Vermont; adding to the list of vice-presidents Hon. W. W. Barrett, of North Dakota.

Prof. Cleveland Abbe, of Washington, was proposed as a member of the executive committee in place of C. C. Binney, and J. Grant Wilson, of New York, as an additional member.

It was recommended that the duties of publication be transferred to the executive committee, and that this committee have the power of filling vacancies.

The report was accepted, the recommendations contained therein were adopted, and the officers nominated were duly elected.

The committee on finance and permanent secretary reported that it was desirable that an effort be made immediately to raise the sum of two thousand dollars for the purpose of employing a salaried secretary or agent, and suggested a method by which to secure this sum. The report was adopted.

Mr. Bowers read a memorial which had been prepared by the executive committee for presentation to President Harrison. It was accepted and ordered to be signed by the executive committee on behalf of the association.

The association then adjourned for the purpose of meeting the President and to reconvene at 2 o'clock at the National Museum.

WEDNESDAY AFTERNOON.

The association met according to adjournment, vice-president Willits in the chair.

The committee on resolutions offered its report as follows:

RESOLUTIONS.

Resolved, 1. That the thanks of the American Forestry Association be extended to the Secretary of the Interior, Hon. John W. Noble, for his presence at our meeting of December 29, and for the earnest expression of a desire to co-operate with the objects of our association.

2. This association expresses its opinion that the opposition to the establishment of public timber reservations arises either from misconception as to their objects and the manner of their management, or as the result of the effort of individuals for their private gain without regard to public welfare.

3. The association respectfully submits to the Secretary of the

Interior that he use the authority granted to him by law, and that he withdraw from settlement and entry temporarily, during examination, all tracts of land recommended for reservations by this association.

4. This association urges upon the superintendents of the public schools in the several States to require that the high schools shall make forestry, in connection with botany, a subject of instruction.

5. WHEREAS, This association holds that the interests of agriculture are ultimately dependent upon a proper forest condition; and

WHEREAS, The Government of the United States has recently made large additional appropriations to the agricultural colleges and experiment stations:

Resolved, That this association earnestly recommends that forestry be made a part in the curriculum of all agricultural colleges and of the experimental work by the various stations where this is not already done.

The resolutions were unanimously adopted.

The association then took up the regular order of business, the hearing and discussion of papers prepared for the occasion by the arrangement of the executive committee.

The first paper read was by Mr. Gifford Pinchot, on "The Development of a Protective Forest Policy in Europe."

The second paper was by Mr. J. D. W. French, on "The Forestry Movement in the United States."

This was followed by a paper from President C. K. Adams, of Cornell University, on "The needs of Forestry Education in the United States."

The reading of these papers was followed by remarks from Judge Higley, of New York; Rev. J. P. Lundy, of Philadelphia; Ex-Governor Hoyt, of Wyoming, and others.

The last paper read was by Mr. B. E. Fernow, on "The Proper Administration of Forest Reserves." The reading of these papers and the accompanying addresses occupied the entire afternoon.

Owing to the lateness of the hour, the usual reading of minutes was dispensed with. The publication of the proceedings was referred to the executive committee, and at 5 o'clock the association adjourned *sine die*.

N. H. EGLESTON,
Secretary.

The association having been prevented from presenting its memorial in behalf of forest reservations to the President on Wednesday, those members of the association who had not left the city assembled at the Executive Mansion, on Thursday, at 10 o'clock. They were individually presented to the President, and Judge Higley explained the objects of the memorial and expressed the grateful feelings of the association for the interest already manifested by the President in its work. The President received the members very kindly and assured them of his sympathy with their efforts and his disposition to do all in his power to favor and co-operate with their endeavors.

Eleventh Annual Meeting.

1892.

The association met at the Department of Agriculture, in Washington, D. C., at 10 o'clock, December 20, 1892.

Hon. Edwin Willits, one of the vice-presidents, took the chair in the absence of president Alvord.

The minutes of the last meeting were read and approved.

The reports of the secretaries and of the treasurer were read and accepted. From the latter it appeared that there was a balance on hand to the credit of the current expense fund of \$362.13, and a balance to the credit of the permanent fund of \$933.36.

The report of the Arbor Day committee was read and accepted. The report stated that in no previous year had so many schools been engaged in the observance of Arbor Day. Among the most cheering signs of progress was the recent action of the American Educational Association, recommending the universal observance of the day, and the establishment of village and district improvement associations, and the planting of memorial trees.

Discussion followed, and the committee was urged to present at the next annual meeting a list of trees most suitable for street planting, with the proper method of planting and trimming the same.

The report of the executive committee was read and accepted, and after the discussion of the subjects presented by it, they were referred to the executive committee for further consideration and such action as might be deemed advisable.

Arrangements having been made with the Secretary of the Interior for a conference in regard to making additional reservations of the public timber lands, and with the Public Lands Committee of the House of Representatives, Messrs. Little, French, Fernow, Bowers, Pellew, Jones, and Eggleston were appointed a committee for this purpose.

At the afternoon session the committee on nominations reported a list of officers for the ensuing year. The report was accepted and the persons nominated were appointed. Nine new members of the association were elected at the same time.

A minute in regard to the death of Dr. J. P. Lundy, one of the most devoted members of the association, was adopted, and the secretary was directed to transmit a copy of it to Mrs. Lundy as an expression of sympathy.

The publication of proceedings and reports, the legal incorporation of the association, and all other business matters were referred to the executive committee, and the association then adjourned *sine die*.

N. H. EGLESTON,
Secretary.

Special Meeting at Chicago.

1893.

A special meeting of the Association was held at Chicago on the 18th and 19th of October, 1893, in connection with the World's Fair Congress Auxiliary.

In the absence of the president, Hon. J. Sterling Morton, Mr. Fernow called the meeting to order and occupied the time which had been assigned for the president's opening address by reading a paper on the "Conditions and Problems of the Forestry Movement in the United States." This paper was followed by an address by Hon. John W. Noble, late Secretary of the Interior, on "Our National Parks and Timber Reservations—their Importance and proper Administration."

Mr. Noble was followed by Prof. William Saunders, of Ontario, Director of the Experimental Farms of Canada, who read a paper on "Forest Conditions on the Plains and Prairies of Canada."

Mr. Aubrey White, Commissioner of Crown Lands in the Province of Canada, then addressed the association in regard to "The Forest Resources of Canada and the Management of the Government Timber Lands."

At the conclusion of Mr. White's address, Mr. Henry L. de Vilmorin, of France, was introduced, who spoke of the selection of seeds for forestry purposes.

At the afternoon session of Wednesday, Mr. J. S. Hobbs, of Maine, read a paper on the forest condition of that State.

Col. Wm. F. Fox, State Superintendent of Forests, read a paper on the forestry conditions of New York.

The next paper read was by Prof. J. T. Rothrock, Forest Commissioner, on the forestry problem in Pennsylvania.

Mr. C. H. Putnam, of Wisconsin, read a paper on the forest condition of the northwestern lumber States.

Mr. W. N. Byers made a brief statement in regard to forest conditions in Colorado.

At the close of the Wednesday session a committee on resolutions was appointed, consisting of Messrs. Hobbs, French, Fox, Bowers, and Ensign.

THURSDAY, OCTOBER 19, 1893.

At the opening of the session a paper was read by Dr. Gustave Niederlein, Argentine Commissioner to the World's Fair, on the forests of the Argentine Republic.

Mr. William Little, of Montreal, next made an address on the forest resources of Canada. He was followed by Mr. E. F. Hobart, Surveyor-General of New Mexico, who read a paper on the forest conditions and needs of the Southwestern Territories.

Mr. W. R. Dobbin then made a report on the work of the Minnesota Forestry Association and the importance of a forest reservation in that State. Mr. J. O. Barrett, State Forest Commissioner, also spoke briefly on the same subject.

Mr. M. L. Saley, editor of the *Northwestern Lumberman*, then presented a paper on "The relation of Forestry to the Lumbering Industry."

A paper on "The relation of Forestry to Lumbering and the Woodworking Industries" was then read by Mr. J. E. Defebaugh, editor of the *Timberman*.

Mr. Gifford Pinchot then made a brief address on the mutual interests of the lumberman and the forester.

Mr. Fernow occupied the remainder of the morning session with a paper on "Timber as a Crop."

THURSDAY AFTERNOON.

The first part of the afternoon session was devoted to matters of business. The selection of the time and place of the next annual meeting was referred to the executive committee.

The committee on resolutions, to whom was referred the resolution of Mr. Hobbs in regard to the exemption of timber lands from taxation, reported the same favorably. After full discussion and some amendments, the resolution was adopted as follows:

Resolved, That the governors of the States of this Union be respectfully requested to recommend legislation in accordance with the following propositions:

First. That the increased value of land arising from the planting of trees, where none were growing, may be exempt from taxation until some profit shall be realized from the plantation.

Secondly. That land covered with tree-growth reserved for farm uses and connected with a farm shall, for the purposes of taxation, be taken at no higher value than if it were without such growth.

The first paper read at this session was by Hon. Warren Higley, on the "Aims and Accomplishments of the American Forestry Association."

Mr. B. S. Hoxie gave an account of the forestry condition of Wisconsin.

Hon. B. G. Northrop read a brief paper on Arbor Day.

The last paper read was by Col. E. T. Ensign, on the "Forest Reserves of the Western Mountain Region."

The committee on resolutions reported the following, which, after some remarks by Mr. Edw. A. Bowers, was unanimously adopted:

Resolved, That it is the sense of this Congress that the policy inaugurated by the United States government of establishing forest reservations on the public domain should be maintained and extended, and that a proper administration of the same, looking to their rational use and protection, is an urgent necessity.

After further remarks by Mr. Bowers, setting forth the legislative action which has been taken in regard to the public timber lands, and what further action was, in his opinion, necessary, the body adjourned *sine die*.

A large number of papers which had been prepared were not read, for want of time. Among them were the following: Forestry in New South Wales, by Robert Hudson, General Superintendent of the New South Wales Exhibit at the World's Centennial Exposition; Condition of Forestry in California, by Abbot Kinney; Forest Administration, State or Federal, by George H. Parsons, of Colorado; Forest Conditions and Forest Problems of Venezuela, by A. Ernst; How May Forestry Interests be Advanced, by Herbert Welsh; Relation of the State to its Forestry, by Hon. J. B. Walker, of New Hampshire; Duty of the Government to Establish Timber Reserves in the Pacific Coast Forests, by E. W. Hammond, of Oregon; Relation of Forest Cover to Waterflow, by Prof. M. C. Read, of Ohio; Relation of Railroads to Forestry, by Howard Miller, Esq.; Forestry Legislation of the States and Territories, by C. C. Closson, Jr., of Massachusetts; Forest Interests and the American Mind, by J. B. Harrison, of New Hampshire; Forest Conditions in the Gulf States, by Charles Mohr, of Alabama; Forest Legislation in Europe, by J. D. Jones, District of Columbia; Forests and Health, by Prof. Cleveland Abbe.

N. H. EGGLESTON,

Secretary.

Twelfth Annual Meeting.

1893.

The twelfth annual meeting of the Association was held at Washington, December 15, 1893. In the absence of president Morton, vice-president Willits presided.

The minutes of the last annual meeting and those of the special meeting at Chicago, held in connection with the World's Fair Auxiliary, were read and approved.

A partial report of the Arbor Day Committee was made by Mr. Eggleston, and it was voted that the committee be continued in office, and that the subject referred to it last year be recommitted to be reported upon at the next annual meeting.

The report of the executive committee was presented by Mr. Fernow. It was accepted and laid upon the table temporarily, with the view of subsequently discussing the matters suggested for consideration by the report.

The secretary made a brief verbal report and referred to the report of the executive committee as embodying his views and showing his work for the past year.

Messrs. Bowers, Stiles, Binney, Newell, and Abbe were appointed as a committee for the nomination of officers and the consideration of amendments to the constitution.

Letters from absent members regretting their inability to attend the meeting were read.

The report of the executive committee being taken up for consideration, the recommendation of the committee that a special meeting of the association, on the invitation of the State Forest Commission of New York, be held at Albany was discussed.

Messrs. Weed, Fox, and Tweedy, officers of the commission, were present, and offered considerations showing the importance of such a meeting to the forestry interests of New York as an aid in securing desirable legislation for the establishment and management of the Adirondack Park.

The recommendation of the executive committee was adopted, and the committee was empowered to make arrangements for the proposed special meeting.

The recommendation of the committee for the publication of the papers read at the special Chicago meeting, or a selection from them, was adopted, and it was voted to appoint a special committee of publication for this purpose.

Mr. Bowers reported his action in regard to the incorporation of the association, and it was voted to take steps as soon as possible to secure such incorporation.

The treasurer's report was read and referred to Messrs. Jones, Elwin, and Fox as an auditing committee. This committee subsequently reported that the accounts of the treasurer were in a satisfactory condition, and was discharged.

The treasurer was authorized, after writing to members delinquent in the payment of their annual dues for the space of two years, to drop them from the list of members.

At the afternoon session papers from Messrs. H. C. Putnam, Abbot Kinney, and others were read. The papers and the subjects involved were referred to the executive committee for their disposal.

Messrs. Fernow, Bowers, and Fox were appointed a committee on resolutions.

The following persons were proposed for membership and were elected:

Messrs. Wm. R. Weed, of Potsdam, N. Y.; C. O. McCreedy, Ballston Spa, N. Y.; Geo. H. Moses, Concord, N. H.; Hon. Wm. E. Chandler, Concord, N. H.; Hon. Redfield Proctor, Proctor, Vermont; Hon. Chas. W. Dabney, Jr., Assistant Secretary of Agriculture; H. S. Russell, E. Greenwich, R. I.; Philip Codman, Brookline, Mass.; C. C. Closson, Lawrence, Mass.

The committee on nomination of officers made a report, and the persons nominated to the respective offices were chosen.

Mr. French expressing his inability to serve as secretary another year, he was, notwithstanding, chosen secretary *pro tem.*, and the executive committee was empowered to elect a permanent secretary, as it should seem desirable and practicable.

An amendment of the constitution was adopted making the executive committee to consist of the president, the vice-president, from the District of Columbia, the secretaries, the treasurer, and six other members of the association.

It was voted to hold the next annual meeting at Washington.

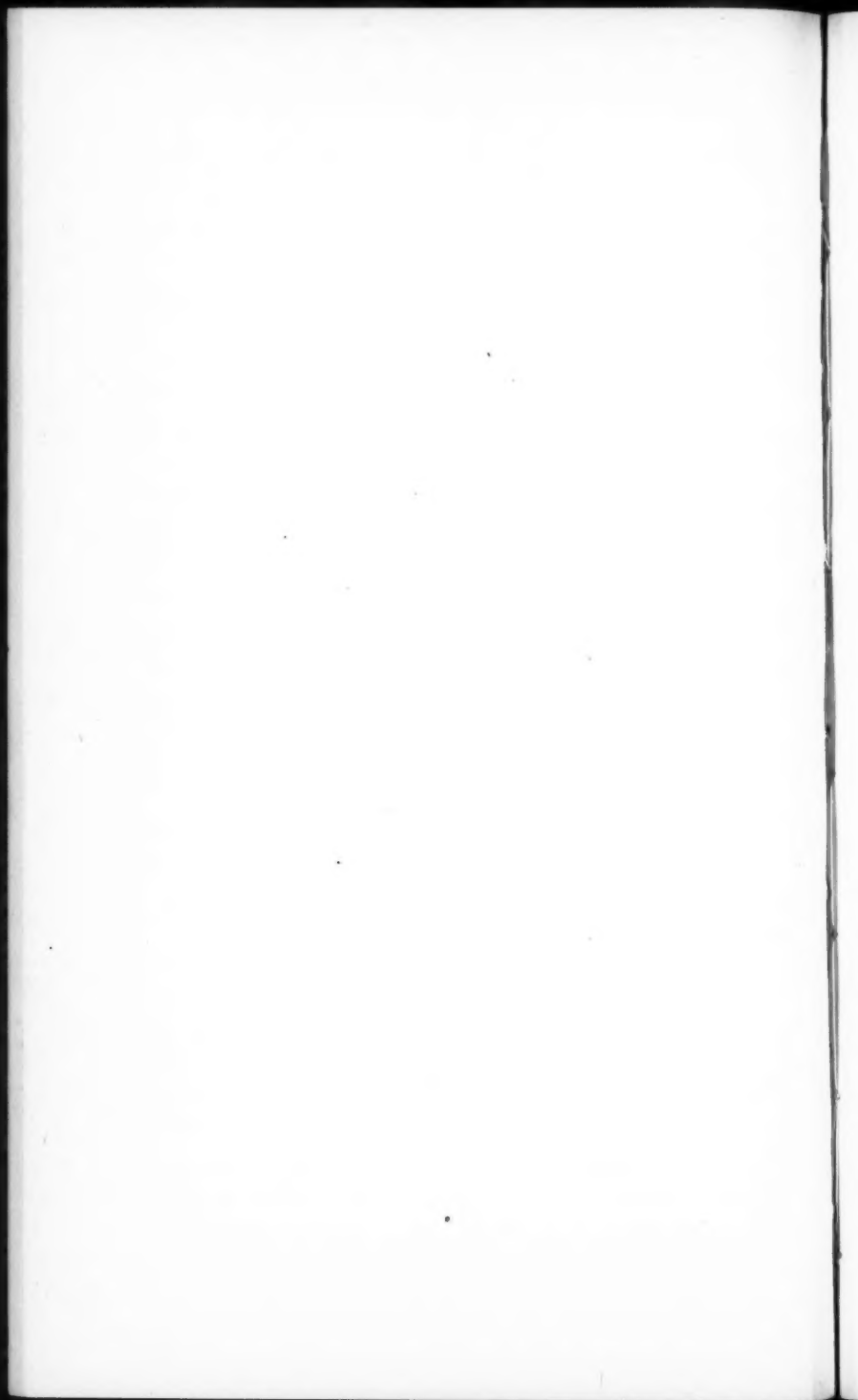
In view of some misrepresentations of the forestry bill—known as the McRae bill, now before Congress, the association referred the subject of its endorsement to the committee on resolutions.

The association sanctioned and approved the action of the executive committee during the last year.

The importance of having a paid secretary who could devote his whole time to the service of the association was considered, and, after discussion, was referred to the executive committee.

A vote of thanks was given to the chairman for his interest in the work of the association and his kindness in presiding at our meetings, after which the association adjourned *sine die*.

N. H. EGLESTON,
Secretary.



MEETING

Held in Chicago, Illinois, October 18 and 19, 1893,

IN CONNECTION WITH

The World's Congress Auxiliary of the World's Columbian
Exposition.

WEDNESDAY, OCTOBER 18, 1893.

The Forestry Congress assembled in room 22 of the Art Institute at 10 o'clock in the morning, Mr. B. E. Fernow, chairman of the committee of arrangements, in the absence of the president of the association, presiding.

After a few introductory remarks on the history, objects, and scope of the present meeting, the chairman read the following paper as an introduction to the subject, which he said would occupy the largest share of the attention of this Congress.

FOREST CONDITIONS AND FORESTRY PROBLEMS IN THE UNITED STATES.

By B. E. FERNOW.

The United States in historic times were not as well wooded as many other countries. Forest growth never covered as much as 60 per cent. of the vast areas stretching across the continent from the Atlantic to the Pacific Ocean; and yet the impression of an inexhaustible forest wealth has been always prevalent. This is readily explained by the distribution of the forest area. The dense and continuous forest which covered the Atlantic side of the continent and the immense forest growth that skirts the Pacific Ocean hardly suggested that nearly half the area of the Union in the interior, with the exception of the mountain slopes and along the river courses, was forestless if not treeless, and that the population which was to settle these fertile acres would have to rely upon the better wooded parts for material to build their houses and barns and their railroads.

During the 400 years since the advent of the Europeans on this continent this 60 per cent. or less of woodland has been reduced to below 25 per cent., not only by clearing for farm purposes, but also by most wasteful cutting and by careless use of fire, turning into useless brush or waste land what might have been an ever-producing resource.

No other people of the earth have consumed virgin forests as lavishly as have the people of the United States. With a present consumption of 380 cubic feet of wood per capita, of which over 50 cubic feet is lumber, they excel the consumption of Germany nearly nine times, that of France nearly 12 times, and that of Great Britain more than 20 times. And since, even for fire-wood, only sizeable timber is used, we may reasonably calculate that to furnish the total present consumption of 24 billion cubic feet or more continuously not less than one billion acres would have to be kept in good productive condition, while at present less than half that forest area exists, and is culled and cut without any regard to reproduction or future condition.

To be sure, there are still enormous quantities of virgin timber available, and although some valuable kinds, like the white pine, tulip popular, ash, and walnut, are or are soon to become practically exhausted, large stores of other timbers remain to supply us for many years.

Yet, even so, serious concern may well be caused with reference to our future supplies by the reflection that large areas of woodland which to the casual and uninitiated observer appear well wooded are so severely culled of the better kinds of timber that for supplies of material useful in the arts they must be counted as unavailable, the very fact that the inferior kinds were left being a serious detriment; reforestation with better kinds by natural reproduction being made thereby impossible, and by artificial planting being made too expensive.

While the rough estimates of our consumption and the condition of our resources are not reassuring of the future, the student of political economy may also figure out the loss to the national commonwealth by depreciation in productive and taxable power of the devastated thousands of square miles which are found wherever the lumberman has finished his work. Furthermore, the effects of improvident clearing or devastation of mountain forests have long become apparent in unfavorable water conditions and agricultural productiveness, just as experienced in other countries, like France, Italy, Austria, etc.

While the loss of material by fires, the scourge of all pioneer countries, in comparison with *bona fide* consumption is but a small matter, perhaps 2 to 3 per cent. of the consumption, the indirect loss caused by them can hardly be overestimated. Not only is the fertility of the soil deteriorated by burning of the mould, but the water-holding capacity of the forest floor, upon which depends the effectiveness of forest influence upon waterflow, is destroyed and, furthermore, conservative forest management is discouraged; the constant risk from fires is an incentive to turn into cash as quickly as possible what is valuable in forest growth, leaving the balance to its fate.

The bulk of the forest lands is owned by private individuals. The idea of State ownership of lands, except for public buildings, forts, etc., and for eventual disposal, has not been germane to the spirit of our institutions until a few years ago, when the friends of forestry succeeded in establishing in some parts a new policy. School lands, indemnity lands, swamp lands, and other lands which the General Government has given to the States or which they have owned otherwise have never been held for an income except by their sale.

Now, however, has not only the State of New York set aside a forest reserve of nearly 1,000,000 acres, to be gradually increased, but the President of the United States has received power to set aside from the public lands forest reservations, under which power some 17,000,000 acres of public timber land have so far been reserved, and at the present writing a bill for the rational management of this newly "sanctified" public property is on its passage through Congress, with a fair chance of becoming a law.

The private ownership of forests may be divided into three classes: the farmers who own wood lots connected with their farms, probably now not 30 per cent. being so owned; the speculators, among whom may be included all those who hold forest property temporarily for the purpose of selling it to obtain the unearned increment from the third class, namely, those who develop and utilize the forest resources—lumbermen and manufacturers, in whose hands finally the bulk of the forest area must fall, and to whom we, therefore, must look for a forest policy.

In addition to the owners of the natural forest resources we must not forget the forest-planters of the West. These are mainly farmers, and the plantations, mostly small groves, increasing in number, value, and quality, stand to the farm in the same relation as the

wood lot in Eastern States. Although this planted area has for the markets as yet no significance, furnishing hardly anything beyond fire-wood and fence material, it is beginning to satisfy the owners that forest-planting is advantageous in many ways, and the experiences gathered in these first attempts will be of value for forest management in the future.

Forest management as practised abroad, when timber is treated like a crop, being systematically harvested and replaced, is utterly unknown, a few feeble attempts on a small scale only being on record. Beyond an occasional attempt at protecting forest property from fire no attention is paid to it except when the wood is to be cut. Usually it is culled of its best timber and then left to its fate. In many cases, by injudicious use of the axe, followed by fire, it is turned into useless brush or waste land, with which many square miles are covered, or it is at least deteriorated in its composition. Thus a large proportion of what appears still well wooded is really of no account as far as supplies are concerned.

Such are the forest conditions of the United States.

The forestry problems are the same as those existing in all highly developed countries. There is no country in which they are fully solved; the difference is only in degree—some being nearer, others less near, to solution.

Broadly stated, the forestry problem of the world—and the same applies to the United States in particular—is, how to reconcile private interest in forest property with communal interests; how to secure the needs of the present without impairing the requirements of the future; how to utilize the forest material and at the same time preserve the forest conditions which are favorable to climate and waterflow.

Private interest, we must never forget, is resolved into the one word profit; and mostly only direct and immediate profit, expressible in dollars and cents, appeals to the private individual.

There is generally but little appreciation of indirect profits or of distant promises of revenue, and still less regard for neighbors or future generations in the conduct of private business.

These last considerations concern, however, the community. While the forest-owner may be satisfied to fill his pocket-book by wastefully cutting and marketing the best of his timber, leaving the balance to deteriorate, the community has an interest in seeing the resources not only fully utilized but continued in productive capacity; the community has an interest in maintaining supplies.

If the private owner does not care whether his forest property, after he has culled the marketable timber, falls a prey to the fire and becomes a waste, the community is certainly concerned in such a result, were it only to preserve the taxing value of its territory.

If by the reckless treatment of the mountain forest the waterflow is disturbed, this may not concern the forest-owner, but it does concern the community, whose duty it is to protect its members against damage by the inconsiderateness of others, to restrict such use of private property as is detrimental to neighbors or to other distant interests. Whatever may be thought of other private property, the forest, experience, experiment, and sound reasoning have shown, bears such a close relation to other cultural and to water conditions that the unrestricted exercise of property rights is apt to lead to conditions detrimental to the interests of the community and of coming generations. How and how far restriction may be applied, or how private forest-owners may be made to consider the interests of the community in the use of their property, or whether and where the community had best take possession of the forest property, that is the general forestry problem.

As far as the Federal Government is concerned, the solution of the problem has been fairly begun. If the present Administration be wise, it will reserve from sale all the remaining public timber lands—somewhat between 50 and 70 million acres only, mostly on the Western mountain slopes—and organize a management of this important property, by which its stores are used conservatively without impairing its reproductive capacity. Such management, crude and simple though it may be at first, consisting of protective measures mainly, may gradually develop into a rational system of forestry.

If the General Government fulfils this duty well, and in addition supports liberally the bureau of information known as the Forestry Division, it will have done all that may be expected of it; not that other aids and encouragements might not be given, such as the establishment of a chair of forestry at West Point, where officers may find instruction in the principles of forestry, fitting them to act intelligently as guardians of the public forest property; or the nationalization of an Arbor Day, to arouse more general attention to the subject; or by legislation regarding tariff on forest products, although at present it is questionable whether the retention or abolishment of the existing tariff may have any effect upon forest conservancy, except, as Mr. Little contends, to remove from the trade papers the

consideration of this subject and to substitute the discussion of forestry problems pure and simple.

But the main reliance for a conservative forest policy, as far as Government action is concerned, lies with the individual States. A beginning has been made in New York by establishing a State Forest Reserve, a feeble beginning in New Hampshire by continuing a Commission of Inquiry; a rational move is to be recorded from Maine in organizing a protection against fire, and a most systematic proceeding from Pennsylvania, consisting in a thorough investigation of the forest conditions of the State with a view to further action. In other States, like California and Colorado, political decrepitude has occasioned at least temporary setbacks to the attempts at establishing a rational forest policy, while in a few other States the movement has not advanced beyond the first stages of agitation and feeble attempts on the part of the governments to establish a basis for action or to disseminate information on the subject.

The first step to be taken by the various State governments, it seems to me, is to place forest property on an equal footing with other property and give it more ample protection against fire and depredation. This is not done by mere paper legislation, but requires provision of an executive machinery, the organization of a service which will be effective in the execution of the law, somewhat like that enacted in Maine and more fully set forth in the Annual Report of the Forestry Division for 1892.

The next step, still more readily made and requiring no new powers, is to provide for at least a short course of lectures on forestry at the agricultural colleges, so that more intelligence regarding the subject be instilled into the people. To this may be added scholarships to be given to students that shall enable them to study abroad the principles of forestry in application, and thus prepare them to direct intelligently the forest policy of their State and of individual forest-owners. A third step, also of ready accomplishment, is to encourage by legislative enactments, similar to those of Massachusetts but more comprehensive, an interest in forest property on the part of villages, towns, and corporations, offering an incentive to them to own and manage such forest areas as appear of essential value to the maintenance of favorable conditions in the community.

Lastly, after such careful survey as is now being made of forest conditions in Pennsylvania, the State should possess itself of such

forest areas as are essential for the maintenance of favorable water conditions, if the smaller communities cannot be expected to do so. These lands, as well as any other forest property of the State, school lands, indemnity lands, etc., should then be properly administered; and while the object of such a State management is not that of private management, namely, profit, such State forests would nevertheless not only be indirectly profitable, but in time become one of the most valuable properties the citizens of the State could boast of.

With such encouragements on the part of the Government as indicated, private forest-owners will soon take advantage of the improved state of affairs and apply such conservative methods as do not curtail their present income too much.

Whatever we may think, theoretically, as to the right and propriety for the State to restrict private owners from exercising their full property rights when it is evident that such exercise is detrimental to the interests of the community, practically we shall not soon see the day when this evident right and propriety of interference will be exercised in this country. Hence, unless the State become itself owner of the land—which, as long as there is valuable timber on it, will also not readily be done in our country—only indirect influences can change the methods of individual owners.

These influences are the increased protection extended to forest property, the opportunity of acquiring the necessary knowledge needed in forest management, the general interest, and the good example exhibited by the State in the management of its own timber lands.

By and by, when it becomes also more evident that the supply of virgin timber is wanting, and that therefore greater profit is to be expected from a conservative treatment of the remaining timber lands, these influences will find their reaction in the methods of the private owners.

To bring about all these various things which are to help in the solution of our forestry problems, it is most needful to enlighten the public as to the true meaning of the problem—to make such propaganda among all classes of our people, and especially among those who own forest property, as will secure an expression of the popular intelligence and will. This is done by associated effort of those who understand the need and importance of action, and it must be done with reference to local conditions in each section of country.

Hence the first, most important, and most promising step towards the solution of our forestry problems is the formation and active exertion of State Forestry Associations, whose function it must be to shape and bring to execution a State forest policy.

Such associations should be composed of business men, men who own and use forest property, lumbermen and manufacturers, who are broad enough to see the need of adjusting private and communal interests on a rational basis, and that private interest will not suffer when communal interest is subserved.

Mr. Fernow then introduced the next speaker in the following words :

"I have alluded to the one step which the Government of the United States has taken towards establishing a new forest policy in this country—the law permitting the reservation of forest areas. What a mighty step this is he only can realize who knows how difficult it is to move a popular government to action. To make this step has required a great deal of perseverance in our propaganda, but even after the law has reached the statute-book it may find the fate of three-fourths of our legislation, becoming inoperative for lack of an executive officer behind it who recognizes its value and brings it to execution. We have with us to-day the man to whom the United States owe more in the establishment of a national forest policy than to anybody else, for he brought that law finally into existence by applying it—by setting aside, under the President's authority, the first forest reservations, thus making the United States own lands for other purposes than for sale. I have the honor of introducing to you the ex-Secretary of the Interior, Honorable John W. Noble."

Mr. Noble spoke as follows on Our National Park and Timber Reservations ; their Importance and Proper Administration :

OUR NATIONAL PARKS AND TIMBER RESERVATIONS; THEIR IMPORTANCE AND PROPER ADMINISTRATION.

MR. CHAIRMAN AND GENTLEMEN :

I recognize that my invitation to this important congress is due rather to my official action, while at the head of the Department of the Interior, in support of the policy of reserving the forests at the fountain-heads of our rivers, and the establishment of our great

national parks, than to any particular qualification on my part now to contribute anything of importance bearing upon the subjects before you for discussion. When the opportunity offered I did my best to aid Congress and the President to inaugurate and advance the policy of timber reservations. That policy has already set apart, besides the national parks, more than seventeen million acres of the public domain, to remain unconverted into private fortunes, and with their mountains and forests, rocks, ravines, and undergrowth, their glaciers, snows, and streams, their storms and sunshine, to preserve and perpetuate timber for the people's use now and hereafter, and, together with the equable temperature of the zone we inhabit, the humidity of the atmosphere and soil, the fulness of the rivers that are to fertilize many millions of acres of our arid lands, to become no more admired and frequented for their wonders and grandeur, their fauna and flora, their health-giving freedom and soul-lifting beauty, than loved for the safety and prosperity they will continue to confer upon new American homes, communities, and States. The interest taken in the subject by you men of science, and the arguments presented, have rendered it possible to make such progress that the state has given recognition to the policy and placed itself upon that high plane of economy and statesmanship that recognizes the riches and beneficence our forests embrace, and that, looking to the welfare of the future generations no less than those of to-day, subjects individual greed to lawful and politic restraint, and compels the inordinately selfish to bide the national welfare.

We have thus been brought into relationship with the other civilized nations of the world on this subject, together with many others, for the science and practice of forest culture and preservation have long been recognized by the nations of Europe as most important. Those nations are interested in our action, as we should be in theirs. The woods of all countries, like their other products and manufactures, have become interchangeable commodities, contributing to the commerce and comfort, wealth and refinement of the different nations of the globe. We are thus able at this congress to contemplate our interests in this department, not only as to our own territory but in relation to those of other people of the world, and by the interchange of knowledge and opinions prepare the way for an international association for the promotion of forestry science.

It has become a prominent duty of the hour to consider the per-

petuation of the blessings we enjoy. The fact that many generations of men must pass away before a forest can be renewed, and its unwise destruction can be remedied, adds a gravity to your counsils and an importance to your success for humanity's sake, unsurpassed by any other; for how much of religion, science or art, education, refinement, and progress can there be in a dominion robbed of its forests and its homes, to all "hastening ills a prey"?

I speak within the bounds of experience and upon the authority of great men who have given this subject their investigation in many lands, and bestowed upon it the thought and labor of their lives. Humboldt has written that in felling trees growing on the sides and summits of mountains men under all climates prepare for subsequent generations two calamities at once—a lack of fire-wood and a want of water. Others have declared that by the fatal connection of cause and effect, which begins with the destruction of forests and ends in the miseries of the population, man is doomed to share the ruin of the soil which he has devastated; that forests given up to sheep, and forests destroyed, make the mountains devoid alike of woods and of life; that forests exploited on no settled system, left open and subject to depredations by the natives, desolated by frequent fires, ruined by the passage of flocks of goats and of sheep which devour the young twigs and shoots, as witnessed in Algiers, yield no revenue and are soon annihilated; that forests are similar to the sea, in their influence reducing the natural difference of temperature in different seasons, while their destruction increases the divergerence between the extreme heat and the extreme cold, imparts greater violence to atmospheric currents and to torrential rains and protracted duration of droughts; that it is not wars which have brought most evil upon the region of the Mediterranean, but aridity, brought on and aggravated by the reckless destruction of woods and by the excessive abuse of pasturing sheep on the mountains; that while there can be raised one of the finest vines on the Rhine, where two thousand years ago no cherry ripened, on the other hand those lands where the dense population of the Jews was nourished by a fruitful culture are in the present day half deserts; the cultivation of clover, requiring a moist atmosphere, has passed from Greece to Italy, from thence to Southern Germany, and is already beginning to fly from the continually drier summers there, to be confined to the moister north; rivers which formerly scattered blessings with equal fulness throughout the whole year now leave the dry and thirsty bed to split and gape in summer, while in

spring they suddenly pour out floods from masses of melting snow, accumulated in winter, over the dwelling-places of affrighted men.

This epitome expresses but a part of the opinions gathered by Dr. Brown in his book on *Modern Forest Economy*, published at Edinburgh in 1884, and were I a Senator I might read the whole book as a part of my speech, but, as I am here with the majority, I refrain. The fact is recognized by all scientific men, that whether or not the forests cause any increase in the rainfall in the regions where they flourish, they do retard the flow of the rainfall after precipitation and maintain a general humidity of the atmosphere and the soil. One author goes so far as to say that the measure of attention given to trees indicates the condition of agriculture and the civilization of a country.

I have read with interest and instruction in the publications of the American Economic Association for May, 1891, the valuable papers of Mr. Fernow, Mr. Pinchot, and Mr. Bowers, and I wish these could be placed in the hands of all our people. These papers, and others like them, could be made the basis of instruction in our common schools and colleges. They present the American view of the question of forest administration in a lucid, convincing way and entirely overthrow the ignorant assertion of some, that the subject of forestry is a hobby, or, at best, an entertaining theme for enthusiasts or sentimentalists.

It will not be deemed invidious, I am sure, for me to also note the efforts in this behalf of the American Association of Science, which, by its president, Professor Mendenhall, its secretary, Mr. Fernow, and their associate committeemen, Messrs. Hilgard, of California, Berry, of Nebraska, and Saunders, of Canada, presented to the President of the United States a memorial on behalf of a proper forest policy, which the President transmitted, with an accompanying message, to Congress on January 20, 1890. This was seconded by another petition of the American Forestry Association and those interested in forestry, to have forest reserves made. This policy was advocated by the administration and has been generously supported by the one now in charge of the Government. It has not been touched by politics, and is receiving both national and local support, with some occasional obstruction by those who are personally interested in appropriating the earth to themselves, or who are uninformed as to the proper functions of the State and the true purpose of its existence.

There had been established already by special acts of Congress

the Yellowstone National Park, the Yosemite, the Sequoia, the U. S. Grant, and the reservation of the Hot Springs of Arkansas. These are placed under the supervision and protection of army officers with cavalry troops especially detailed, or a superintendent especially authorized for the purpose.

Where such magnificent and wonderful natural objects exist as may be found in either of these preserves, the public has been at once convinced of the propriety of governmental care. There is, perhaps, no disinterested person who would desire or consent to the repeal of either these acts of Congress, or allow they should be so relaxed as to threaten the serious impairment of the reservations. It is true, private interests, regardless of the public welfare, oppose some of them, but this is rather to be attributed to selfishness, regardless of the public welfare, than to a want of appreciation of the national benefits secured. These assaults have, so far, been fruitless, and we hope will soon, if they have not already, become wholly discouraged. These parks are in great measure exponents of our civilization; our advanced recognition, not only of the wonders and benefits bestowed upon our country by nature, but also of our responsibility to all the world for their preservation for the instruction and enjoyment of the present and future generations of mankind. They are already celebrated among all nations, and literature and art have made them familiar in all households of intelligence. To the present World's Fair they have supplied objects that have gained as much attention and given as much entertainment and pleasure as any here exhibited. They should and must be maintained.

They are, moreover, valuable object lessons for the treatment of those other timber reservations now widely made. Captain Wood, acting superintendent in the reserve about the Yosemite Valley and of the reservation about the great trees, who has command there of a cavalry troop, states in his report for the past year that while two fires occurred, they were both subdued. One reached the Tuolumme Grove and barely touched one of the Sequoias, without injuring it. This spread from the fire left by some careless camping party. The other was extinguished by driving it against the south fork of the Tuolumme River. This originated outside. There have been no appropriations to supply means to extinguish such fires, and the troops had to resort to gunny-sacks, brush brooms, and other crude devices. He remarks that the fires there do not make much of a current of air, burn slowly, and can usually be approached

with impunity. He suggests that with iron headed and toothed rakes advantage could be taken of the open spaces and the combustible matter there so arranged as to back-burn and thus check the fire effectually. It is to be also mentioned that the captain has ejected the sheep-herders and their flocks on their every advent, and that, too, without much ceremony.

Captain Anderson, in charge of the Yellowstone National Park, and also in command there of a troop of cavalry, has reported that after two years of remarkably good fortune in dealing with fires, there occurred in July a disastrous one, but all the available men watched and fought this fire for two weeks, and at last, when the report was made, it was deemed under control. The report is very instructive as to the great increase of game and fish in the reservation, but my purpose is to illustrate, by the references made, how efficient these forces have been, although almost without means, to discover and check that greatest enemy of the forest—fire. Certainly true statesmanship would at once supply both exact laws and efficient means to defend them from all depredations and losses inflicted by lawless men or the elements, and these laws and means should, in like wisdom, be extended to the greater timber reservations.

Of the timber reservations, we now have the following: In Colorado, that of the White River Plateau, of more than a million acres; the Pike's Peak, of nearly two hundred thousand acres; the Plum Creek, of about the same dimensions; the South Platte, of more than half a million acres; and of the Battlement Mesa, of over eight hundred thousand acres. In New Mexico, that of the Pecos River, of over three hundred thousand acres. In Oregon, that of Bull Run, of nearly two hundred thousand acres; that of the Cascade Range, of about four million and a half acres; and of Ashland, embracing nearly nineteen thousand acres. In Wyoming, the addition to the Yellowstone National Park, of nearly a million and a quarter acres. In California, the San Gabriel, of over half a million acres; that of the Sierra, of over four million acres; of the San Bernardino, of over seven hundred thousand acres; and that of the Trabuco Canyon, of about fifty thousand acres. In Washington, that of the Pacific, of nearly a million acres. In Arizona, that of the Grand Canyon of the Colorado, of over one million eight hundred thousand acres. In Alaska, that of the Afognak Forest, and Fish Culture Reservation, embracing the whole island and circumjacent rocks and waters. These reservations embrace in all over seventeen million acres.

These reservations are chiefly at the sources of great rivers and among the mountains, and all in regions almost altogether unsuitable for agriculture. No doubt parts of each could sustain a few farms or ranches or graze a small number of cattle, but in the main they are as I have designated. They were each carefully inspected by competent officers, who not only with great labor traversed these distant and almost inaccessible wilds, but canvassed for the public opinion of the people around about where they were made, and gave long and exact notice of the purpose for making these reservations. They were made with careful preservation of all existing legal claims by individuals. They are not so reserved as to be of use only in their natural unimproved condition, but those interested as a community are allowed to go upon them for the purpose of accumulating and directing the water for the general use; but not to destroy or individually appropriate to personal advantage what God and the Government have ordained should be for all. An illustration or two will show the general purpose.

From the Sierra Range, where are reserved, as we have seen, the four million acres, run the waters to feed the streams of the San Joaquin Valley. In these vast solitudes are garnered snows that in places reach the depth of forty feet, and there are forests and undergrowth, of great extent, that in their natural condition protect and preserve the waters, as the snows melt, in such degree that they supply the rivers for a great part, if not the entire summer, making the lower lands, under due cultivation, fruitful and the pride of the State. But already, before the reserve was effected, the sheep-herder was gradually invading these mountains with his immense flocks, making havoc on all sides. These flocks, as we have already noted, as they have done in other lands, were rapidly denuding the surface of all herbage, and each succeeding year the herder was increasing in his anxiety that the sun should have early effect upon the snow, and that the waters should escape that the grass and flora might the earlier appear and be available for forage. It was but a duty of good government to stay this vandalism and assert the national power to secure a nation's rights.

In the vast area around the Yosemite Valley, the sheep had, before that reservation by Congress, already cut down the undergrowth, so that there was scarcely enough even for the sheep themselves, and the goat would soon have had to be substituted, as in Algiers. This reserve, under the protection of the United States cavalry from May to November, is once more assuming the condi-

tion of usefulness and beauty that gives assurance of permanent future prosperity to the neighboring valleys.

Along the Colorado Canyon grow the most extensive forests of large pine trees, and with these are associated the attractions and wonders of the canyon itself, explored by and to be ever associated with the name of one of the best friends of the cause we advocate—Major J. W. Powell. These the railroads and the timber speculator have not yet reached. When they arrive, there will be a mighty effort of the lobby to undo the reservation and confer upon individuals and corporate bodies the wealth of the people and the safety of future generations. It is to be hoped, and indeed it may now be well expected, that the strength of your associations will have so increased, and the knowledge of what is at stake so generally diffused among our citizens everywhere, that all such efforts will fail, and the legislation in behalf of all these reservations will have become more elaborate and effective and worthy of our Government, so that the great trust Nature and Nature's God have imposed upon us will be regarded and enforced.

What should be the detail of that protection there is not time to specify. But this much is apparent: the forests already reserved by executive proclamation should be confirmed by statute: they should be surveyed and plainly marked by lasting monuments. Around about them and through them at moderate intervals should be made passage-ways sufficiently wide to form barriers to fires: over them should be appointed superintendents, each with a corps of mounted guards to patrol and protect the woods from fire and spoliation. Concerning them should be established rules for their legitimate and needful use by the people, according to the demands of agriculture and homes, with exact and severe penalties for all wilful violations of the law and all fraudulent practices: and, behind all, a bureau with schools of instruction to prepare those to be employed by intelligence and experience for the exact and efficient performance of their forestry duties. The system should be extended over the Indian reservations. No better or more rational instruction could to-day be conferred upon the Indians themselves, who possess great forests, than instruction in forestry, so that they should appreciate and economize the wealth they have. The rules of civil service should be applied to the officers and most of the employees at the reservation, so they would represent the people and not politicians.

If we can thus preserve these vast and valuable domains, the

great system of irrigation now so rapidly advancing will grow to the full extent of redeeming many millions of acres of the arid lands, and be continued to all coming generations. Nature, aided by man's intelligence and industry, will bestow her waters upon the deserts, and our ever increasing and expanding population will enjoy a new and unexpected inheritance, now abandoned to the sagebrush and the cactus. There will arise new fields of fertility and new avenues of commerce. The products of the labor at the homes and cities there in agriculture, horticulture, and manufactures will secure for the inhabitants a prosperity and a civilization that will vie with, if they do not surpass in variety and splendor, those of our proudest rain-blessed commonwealths. Instead of such desolation as that of the lands along the Nile, the Tigris, and Euphrates, which now characterizes our arid regions, they will create and sustain communities and cities with which Alexandria, Nineveh, and Babylon in the height of their power cannot be compared; for they will not only exceed them in wealth, power and refinements of life, but they will enjoy a Christian civilization and the blessings of a free republican government.

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